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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,522	02/20/2004	Roy Lurie	MWS-109RCE3	7481

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EXAMINER	
WHALEY, PABLO S	
ART UNIT	PAPER NUMBER
1631	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/783,522	LURIE ET AL.	
	Examiner	Art Unit	
	PABLO WHALEY	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 August 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-50* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-50* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/19/2011 has been entered.

Applicant's Response

Applicant's amendments and remarks, filed 08/19/2011, are acknowledged.

The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Status of Claims

Claim 51 is cancelled.

Claims 1-50 are currently pending and under consideration.

Withdrawn Rejections

The rejections of claims 1-50 under 35 U.S.C. 103(a) as being made obvious by Lett, Cook, Fox, and Potts are withdrawn in view of applicant's amendments.

The nonstatutory obviousness-type double patenting rejection is withdrawn in view of applicant's amendments.

Claim Rejections - 35 USC § 112, 1st Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

This is a NEW MATTER rejection.

Claims 1-50 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

Amended claim(s) 1, 12, 22, 28, 37, and 45 recite "*wherein modifying the model affects a memory layout of the subsystem to result in a second memory layout*." However, neither the original claims, original drawings, nor the specification as originally filed provides support for this limitation. There is simply no discussion of models affecting memory layouts of subsystem or the creation of additional memory layouts, and no basis has been pointed to for these new limitations in applicant's remarks. In the absence of support for the newly recited limitations, these claims and claims dependent thereon are deemed to constitute new matter.

Claim rejections - 35 USC § 112, 2nd Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

> The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of: (A) The content of the particular application disclosure; (B) The teachings of the prior art; and (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

Claims 1-50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims that depend directly or indirectly from claims 1, 12, 22, 28, 37, and 45 are also rejected due to said dependency.

Amended claim(s) 1, 12, 22, 28, 37, and 45 recite registering an area of memory that "*constitutes a simulation context for a subsystem in the block diagram model.*" This phrase is problematic for the following reasons: (1) Neither the claim(s) nor the specification defines the metes and bounds of a "simulation context" such that a person of ordinary skill in the art would understand what limiting effect is intended [See MPEP 2173.02]. (2) As a result, it is unclear what limiting effect of the claimed method (and program) is intended by registering an area of memory that *constitutes a simulation context for a subsystem in the block diagram model*. For example, if this limitation is intended to be storing model simulation conditions for a sub-routine within a block diagram model to an area memory, this is not clear from the current claim language. Accordingly, the claim is indefinite.

Amended claim(s) 1, 12, 28, 37, and 45 recite "*wherein modifying the model affects a memory layout of the subsystem to result in a second memory layout*." However, the claimed is directed to a method (and program) for modifying a model of a biological process. Therefore, it is unclear what limiting effect of the claimed method is intended by

further limiting the memory structure within a computer. Additionally, it is unclear as to the metes and bounds of a "memory layout" such that one of skill in the art, after reading the specification, would understand what limiting effect is intended. Accordingly, the claims are indefinite.

Amended claim(s) 1, 12, 22, 28, 37, and 45 recite "*using the stored simulation context to restore the simulation to a state consistent with the simulation context after the simulation finishes.*" It is unclear whether this limitation is intended to be an intended use or an active method step. If the later, it is unclear what positive process is intended. Furthermore, it is unclear what is meant by a *'state consistent with the simulation context after the simulation finishes*'. Accordingly, the claims are indefinite. For purposes of examination, this step is interpreted as "restoring" a simulation to its original state.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
>
> This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 5-14, 16-23, 25-30, and 32-36 are rejected under 35 U.S.C. 103(a) as being made obvious by The MathWorks (Using Simulink 5, Published 2002, pages 1-476), in view of Lett et al. (WO 02/099736; Published 12 December, 2002; IDS filed 11/08/2004).

For purposes of examination, the claimed invention is interpreted as being directed to a method, program, and apparatus for modifying a biological model by: (i) accessing a block diagram model of a biological process; (ii) generating results from executing a block diagram model of a biological process by performing a simulation of the block diagram model with a simulation engine; (iii) registering an area of memory that constitutes a simulation context for a subsystem in the block diagram model, the subsystem associated with a first memory layout, wherein the simulation context comprises one or more values for one or more attributes, and the values are established during the simulation of the block diagram model; (iv) gathering data directly from an in situ experimental device on which an ongoing in situ experiment of the biological process is conducted; (v) comparing the generated result to the data gathered from the

experimental device using an analysis environment that is in communication with the simulation engine; (vi) modifying the model of the biological process based on the comparison to correct the model of the biological process, and (vii) restoring the simulation to an original state using the stored simulation context.

The Mathworks, hereinafter referred to as Mathworks, teaches a software package (Simulink) for modeling, simulating, and analyzing time-dependent systems. Regarding steps (i) and (ii), Simulink includes functionality for accessing and simulating a block diagram model having a plurality of sub-subsystems and graphically displaying results (pages 8-9, 45-49, 81, 116-120, 392-95, and 401-406).

Regarding step (iii), if applicant intends for registering an area of memory to mean saving data to memory, Simulink includes functionality for creating, accessing, and saving data objects, block parameters (i.e. simulation context for a subsystem), and values of a block diagram (pages 266-68 and 390). These elements can be saved as files or saved to memory (pp.7-12, 344, and 423). If applicant intends for registering an area of memory to mean allocating memory, Simulink includes functionality for allocating a separate memory buffer for each block's outputs (page 335), which reads on associating each block output with a first and second memory layouts.

Regarding step (iv), Mathworks does not teach modeling biological processes and gathering data from an in situ device, but suggests this limitation since Simulink includes functionality for gathering experimental data from an experimental device (e.g. a thermostat in a house), and by providing I/O hardware that one of skill in the art would understand how to connect to an external experimental device (page 27-28, 321, and 422).

Lett teaches a computational method and system for updating or modifying biological simulation models [Abstract and p.10-12]. In particular, Lett provides tools for performing biological simulations by obtaining time-series data from a gene-chip and microarray data [Ref. claims 18, 19, and p.18] and from experimental imagers [p.11-12], which reads on gathering data from an in-situ experimental device since the data is obtained over time.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to have used the simulation program taught by MathWorks for modeling biological processes by gathering data form external devices, such as in situ microarray devices, since computational methods and tools for obtaining such data and using it to model biological process were known in the art, as suggested by MathWorks and taught by Lett. One of skill in the art would have expected these teachings could have been combined with predictable results since MathWorks provide a generic simulation program that can be used to simulate any type of system. The rationale would have been combining known elements according to known methods to yield predictable results.

Regarding step (v), this limitation is disclosed or fully envision by the combination of MathWorks and Lett. In particular, MathWorks suggests this limitation because Simulink includes functionality for comparing simulation results with those from a source control system (i.e. an external system) or in memory (page 319, 423, and 425) in order to determine differences. In addition, Lett teaches comparing predicted image data with acquired image data [p.14].

Regarding step (vi), Simulink includes functionality for updating and modifying the block diagram and running the simulation (page 212). The combination of

MathWorks and Lett do not specifically teach that the modifying affects a memory layout of the subsystem to result in a second memory layout. However, this limitation would have been obvious to one of skill in the art since Simulink includes functionality for storing model parameters to memory and allocating a separate memory buffer for each block's outputs, as set forth above, since Lett provides tools for storing model parameters to primary memory (RAM) and second memory [page 12, last ¶[], as discussed above, and since the specification does not provide a limiting definition for a "memory layout" that would serve to structurally or functionally distinguish this from the memory taught by MathWorks and Lett.

Regarding step (vii), Simulink includes functionality for restoring block diagram settings, parameters, and behavior (i.e. simulation context) after closing (pages 84, 204, 266, and page 344).

Regarding all additional dependent claims, these limitations are disclosed or fully envision by the combined teachings of MathWorks and Lett. In particular, MathWorks provides tools for graphically displaying results, as set forth above. MathWorks provides tools for comparing data to thresholds (pages 60, 316). MathWorks provides I/O ports for transmitting data to a modeling environment, as set forth above. MathWorks provides methods for analyzing an updated model, as set forth above.

Claims 4, 15, 24, 31, and 37-50 are rejected under 35 U.S.C. 103(a) as being made obvious by MathWorks in view of Lett, as applied to claims 1-3, 5-14, 16-23, 25-30, 32-36, above, and further in view of Fox et al. (WO 03/042857, Published 22 May

2003; IDS filed 11/08/2004), and in view of Potts et al. (US 6,882,940; Filed Aug. 10, 2001).

MathWorks and Lett make obvious a method, program, and system for simulating biological processes using a block diagram simulation model, as set forth above. Additionally, Lett teaches a display for displaying simulation results to a user [See at least Fig. 1 and 2], as in claim 46.

MathWorks and Lett do not teach modifying a model of a biological process wherein the process is a chemical reaction, as in claims 37-39, 41-45, and 48-50.

MathWorks and Lett do not teach generating an event signal when the difference between the result and data gathered from the device exceeds a threshold, as in claims 4, 15, 24, 31, 40, and 47.

Fox teaches a method and system for inferring biochemical interaction networks including chemical reactions from dynamical or static experimental data, and a database of possible interactions [0065]. The simulation process operates according to a block diagram and includes the use of threshold values [Fig. 7, Fig. 8].

Potts teaches a prediction system with a modeling environment that allows for user-settable threshold levels [Col. 13, lines 20-25] and functionality for generating an alert signal when a measured signal is outside of the predetermined range of values [Co. 7, lines 20-23].

It would have been obvious to someone of ordinary skill in the art at the time of the instant invention to have alternatively modeled a chemical reaction, as taught by Fox, using the method, program, and system made obvious by MathWorks and Lett, since computational methods for modeling chemical reactions using block diagram were

known in the art, in view of Fox [0065, Fig. 7, Fig. 8], and beneficially used for discovering new interactions within the biological system under investigation, as suggested by Fox [Abstract].

It would have been obvious to someone of ordinary skill in the art at the time of the instant invention to have generated an event signal when the difference between the result and data gathered from the device exceeds a threshold, using the method, program, and system made obvious by MathWorks and Lett, since Fox suggests the use of thresholds in a block diagram simulation process with predictable results, as set forth above, and since computational methods for generating alert signals using threshold ranges were known in the art, in view of Potts [Co. 7, lines 20-23]. The motivation would have been to improve simulation by generating warning messages when there are images with statistical differences between them, as suggested by Lett [p.15].

Response to Arguments

Applicant's arguments, filed 08/19/2011, have been fully considered but are moot in view of the new grounds of rejections. It is noted that the prior art of MathWorks has been applied to address new claim limitations. The prior art of Lett, Fox, and Potts are still relied upon, but not as teachings for the new claim limitations.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pablo Whaley whose telephone number is (571)272-4425. The examiner can normally be reached between 11am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran can be reached at 571-272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Pablo S. Whaley/

Examiner, Art Unit 1631